

Claims

- [c1] A control system for controlling a safety system of an automotive vehicle comprising:
a plurality of wheel speed sensors generating a plurality of wheel velocity signals;
a steering angle sensor generating a steering actuator angle signal;
a yaw rate sensor generating a yaw rate signal;
a lateral acceleration sensor generating a lateral acceleration signal; and
a controller coupled to the plurality of wheel speed sensors, the steering actuator angle sensor, the yaw rate sensor, the lateral acceleration sensor, said controller generating a final reference vehicle velocity in response to the plurality of wheel velocity signals, the steering angle signal, the yaw rate signal and the lateral acceleration signal, said controller controlling the safety system in response to the final reference vehicle velocity.
- [c2] A control system as recited in claim 1 wherein the safety system comprises a rollover control system.
- [c3] A control system as recited in claim 1 wherein the safety system comprises a yaw control system.

- [c4] A control system as recited in claim 1 wherein the safety system comprises an antilock brake system.
- [c5] A control system as recited in claim 1 wherein the final reference vehicle velocity is determined in response to a learning function.
- [c6] A control system for an automotive vehicle comprising:
a plurality of wheel speed sensors generating a plurality of wheel velocity signals;
a lateral acceleration sensor generating a lateral acceleration signal;
a safety system; and
a controller coupled to the plurality of wheel speed sensors, the lateral acceleration sensor and the safety system, said controller determining a preliminary longitudinal velocity of the vehicle from the plurality of wheel velocity signals, determining a plurality of correction factors for the plurality of wheel velocity signals, determining a vehicle reference velocity in response to the plurality of correction factors, the plurality of wheel velocities and the preliminary longitudinal velocity, determining a vehicle reference velocity correction factor in response to the lateral acceleration, determining a final reference velocity in response to the velocity correction factor and the vehicle reference velocity, said controller controlling

the safety system in response to the final reference vehicle velocity.

- [c7] A control system as recited in claim 1 wherein the safety system comprises a rollover control system.
- [c8] A control system as recited in claim 1 wherein the safety system comprises a yaw control system.
- [c9] A control system as recited in claim 1 wherein the safety system comprises an antilock brake system.
- [c10] A control system as recited in claim 1 wherein determining a plurality of correction factors is performed using a learning function.
- [c11] A control system as recited in claim 1 wherein the learning function averages N correction factors, where N is an integer.
- [c12] A control system as recited in claim 1 further comprising said controller determining a nominal rolling radius, wherein the wheel velocity is a function of vehicle speed.
- [c13] A method of controlling a safety system for an automotive vehicle having a plurality of wheels comprising:
 - determining a plurality of wheel velocities for the plurality of wheels;
 - determining a preliminary longitudinal velocity of the ve-

hicle from the plurality of wheel velocities;
determining a plurality of correction factors for the plurality of wheel velocities for the plurality of wheels;
determining a vehicle reference velocity in response to the plurality of correction factors, the plurality of wheel velocities and the preliminary longitudinal velocity;
determining a lateral acceleration;
determining a vehicle reference velocity correction factor in response to the lateral acceleration;
determining a final reference velocity in response to the vehicle reference velocity correction factor and the vehicle reference velocity; and
controlling the safety system in response to the final reference velocity.

- [c14] A method as recited in claim 13 further comprising determining a yaw rate determining a plurality of preliminary lateral velocity of the vehicle from the plurality of wheel speeds and the yaw rate.
- [c15] A method as recited in claim 13 further comprising determining a front steering angle, wherein determining a plurality of correction factors are determined in response to the front steering angle.
- [c16] A method as recited in claim 13 wherein said safety system comprises at least one selected from a rollover sta-

bility control system, a yaw control system, a traction control system or an antilock brake control system.

[c17] A method as recited in claim 13 further comprising using a learning function in the step of determining a plurality of correction factors.

[c18] A method of controlling a safety system for an automotive vehicle having a plurality of wheels comprising:
determining a plurality of wheel velocities for the plurality of wheels;
determining a yaw rate;
determining a preliminary longitudinal velocity of the vehicle from the plurality of wheel velocities and the yaw rate;
determining a front steering angle;
determining a plurality of correction factors for the plurality of preliminary wheel speeds in response to the front steering angle;
determining a vehicle reference velocity in response to the plurality of correction factors and the plurality of correction factors and the preliminary longitudinal velocity.

[c19] A method as recited in claim 18 further comprising determining a lateral acceleration;
determining a velocity correction factor in response to

the lateral acceleration; and
determining a final reference velocity in response to the velocity correction factor and the vehicle reference velocity.

[c20] A method as recited in claim 18 further comprising using a learning function in the step of determining a plurality of correction factors.

[c21] A method as recited in claim 18 wherein said safety system comprises at least one selected from a rollover stability control system, a yaw control system, a traction control system or an antilock brake control system.